

**Final
Site-Specific Safety and Health Plan Attachment
Site Investigation at Artillery and Mortar Impact Areas South
of Bains Gap Road, Parcels 138Q-X, 139Q-X, 140Q-X, 141Q-X,
and 142Q-X**

**Fort McClellan
Calhoun County, Alabama
EPA ID No. AL7 210 020 562**

Prepared for:

**U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602**

Prepared by:

**IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923**

**Task Order CK10
Contract No. DACA21-96-D-0018
IT Project No. 796887**

January 2001

Revision 1

This Site-Specific Safety and Health Plan must be used in conjunction with the Installation-Wide Safety and Health Plan, Fort McClellan, Alabama.

Site-Specific Safety and Health Plan Attachment Approval Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan attachment for the site investigation of Artillery and Mortar Impact Areas South of Bains Gap Road at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.

Jeanne Yacoub, PE
Project Manager

Date

Bill Hetrick, CIH
Health & Safety Manager

Date

Jeff Tarr
Site Coordinator

Date

Acknowledgements

The final approved version of this site-specific safety and health plan (SSHP) attachment for the site investigation of Artillery and Mortar Impact Areas South of Bains Gap Road at Fort McClellan, Alabama, has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every 6 months until project completion.

Project Manager

Date

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and the health and safety manager.

Site Coordinator

Date

Site-Specific Safety and Health Plan Acknowledgement Form

I have been informed of, and will abide by the procedures set forth in, this site-specific safety and health plan attachment for the site investigation of Artillery and Mortar Impact Areas South of Bains Gap Road at Fort McClellan, Calhoun County, Alabama.

Printed Name

Signature

Representing

DateThis image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Fort McClellan Gate Hours

Baltzell Gate	Baltzell Road. Open 24 hours daily, 7 days a week.
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Fort McClellan Project Emergency Contacts

Fire Department (on post)	911
Fire Department (off post).....	(256) 237-3541
Ambulance (off post)	911
Regional Medical Center.....	(256) 235-5121
Military Police (SSG Busch).....	(256) 848-5680, 848-4824
DOD Guard Force (Mr. Bolton).....	(256) 848-5680, 848-4732
Anniston Police Department	(256) 238-1800
Chemical Agent Emergencies	(256) 895-1598
(Ken Barnett, CEHNC)	cell phone (205) 310-0604
UXO Emergencies.....	(256) 895-1598
(Ken Barnett, CEHNC)	cell phone (205) 610-0604
UXO Nonemergencies/Reporting Only (Ronald Levy)	(256) 848-3758
Baltzell Gate Guard Shack (Staffed 1600-0700 hours, Mon-Sun).....	(256) 848-5693, 848-3821
National Response Center & Terrorist Hotline	(800) 424-8802
Poison Control Center	(800) 462-0800
EPA Region IV.....	(404) 562-8725
Ronald Levy, Chief, FTMC Environmental Management.....	(256) 848-3758
Ellis Pope, U.S. Army Corps of Engineers	(334) 690-3077
Jeanne Yacoub, IT Project Manager	(770) 663-1429
Bill Hetrick, IT H&S Manager.....	(865) 690-3211, pager (888) 655-9529
Mike Moore, Fort McClellan Safety Officer.....	(256) 848-5433
Dr. Jerry Burke, IT Occupational Physician.....	(800) 350-4511

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List of Acronyms

See Attachment 1, List of Abbreviations and Acronyms of the site-specific field sampling plan attachment contained in this binder.

1.0 Site Work Plan Summary

Project Objective. The objective of this investigation at Fort McClellan (FTMC), Calhoun County, Alabama is to collect and analyze samples at the Artillery and Mortar Impact Areas South of Bains Gap Road.

Project Tasks

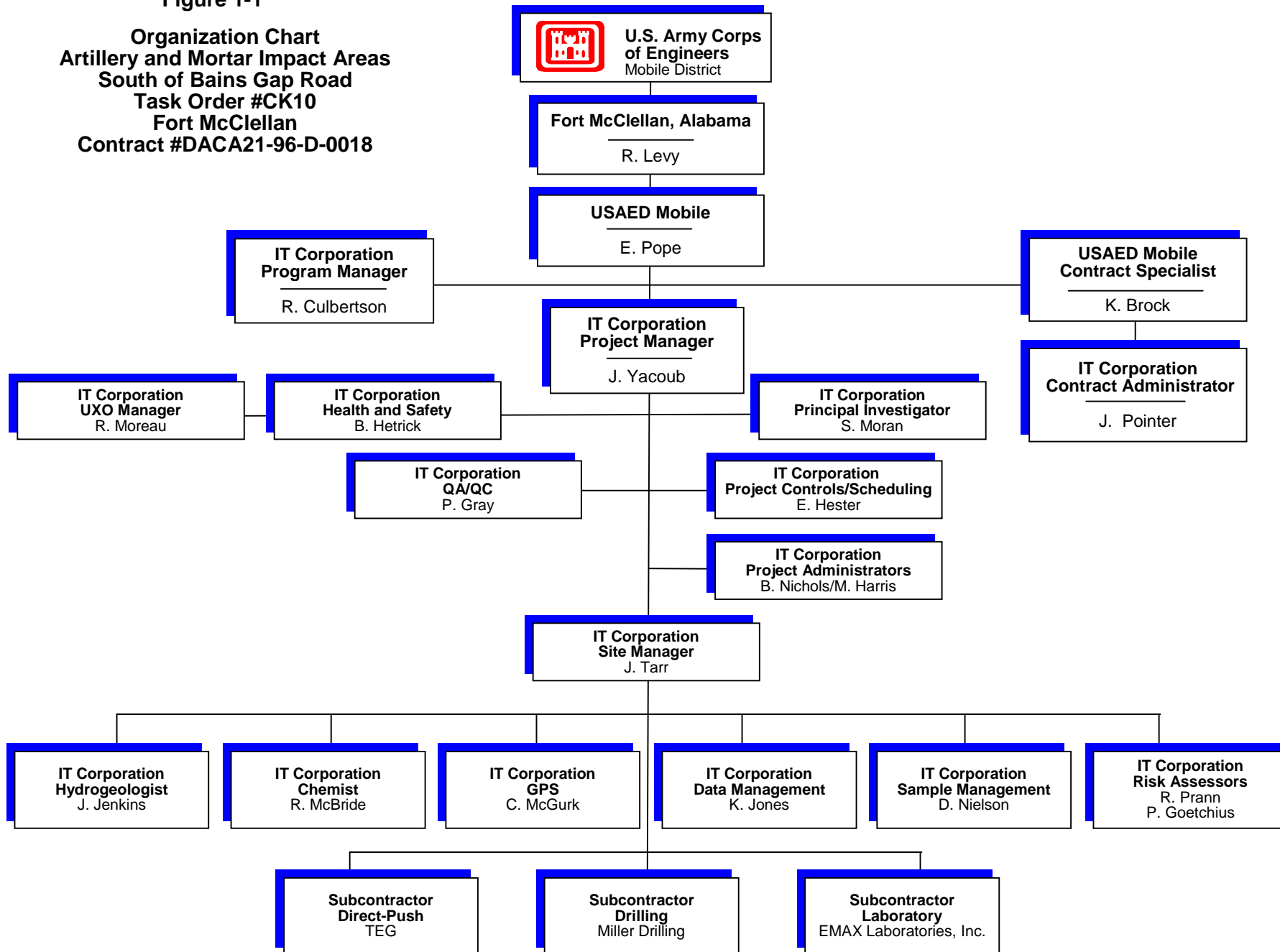
- Survey work area.
- Conduct a surface and near-surface unexploded ordnance (UXO) survey over all areas to be included in the supplemental sampling effort for the purpose of UXO avoidance.
- Provide downhole UXO support for all intrusive drilling activity to determine buried downhole hazards for the purpose of UXO avoidance.
- Collect surface soil samples, subsurface soil samples, surface water, seep water, and sediment samples.

Personnel Requirements. Up to 15 employees. See Figure 1-1 for an organization chart.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan (SHP) for site investigations at FTMC, and be familiar with the requirements of this site-specific SHP. This site-specific SHP must be used in conjunction with the SHP, FTMC, Alabama.

Figure 1-1

**Organization Chart
Artillery and Mortar Impact Areas
South of Bains Gap Road
Task Order #CK10
Fort McClellan
Contract #DACA21-96-D-0018**



2.0 Site Characterization and Analysis

2.1 Anticipated Hazards

The activity hazard analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The activity hazard analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE). Site control with the use of specific work zones (support zone, contamination reduction zone, and exclusion zone) is addressed in Section 7.0 of Appendix A of the March 2000 IT installation-wide sampling and analysis plan.

Range descriptions and history are included in Section 2.0 of the work plan for the site investigation of Artillery and Mortar Impact Areas South of Bains Gap Road.

The possibility of UXO exists at the Artillery and Mortar Impact Areas South of Bains Gap Road; therefore, UXO surface sweeps and downhole surveys of soil borings will be required to support field activities at the Artillery and Mortar Impact Areas South of Bains Gap Road. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purpose of UXO avoidance.

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used at the site investigation of Artillery and Mortar Impact Areas South of Bains Gap Road. The contaminants of concern at the area are lead and nitroexplosives.

2.2 General Site Information

Duration of Planned Employee Activity. Employee activity duration is 1 month.

Pathways for Hazardous Substance Dispersion. Possible pathways for hazardous substances in the area are surface water, groundwater, sediment, and soils.

Table 2-1

Physical Properties of Chemicals
Site Investigation at Artillery and Mortar Impact Areas South of Bains Gap Road
Fort McClellan, Calhoun County, Alabama

(Page 1 of 3)

Substance [CAS]	IP ^a (eV)	Odor Type & Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Acetone [67-64-1]	9.7	sweet/fruity 13B100	Inh Ing Con	Irritated eyes, nose, and throat; headache, dizziness; dermatitis; CNS depression.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	1,000 ppm 500 ppm	NA 750 ppm	PEL TLV	2500 ppm [LEL]
Diesel fuel [NA]	NA	oily NA	Inh Ing Con	Ingestion causes nausea, vomiting, and cramps; CNS depression, headache, coma, death. Inhalation causes pulmonary irritation, lightheadedness. Aspiration causes severe lung irritation, coughing pulmonary edema. Irritant to skin and mucous membranes.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention Aspirate: Immediate medical attention	NA 100 mg/m ³ (skin) (NIC)	NA NA	PEL TLV	ND
Isopropyl alcohol (isopropanol) [67-63-0]	10.10	sharp/ rubbing alcohol 37-610	Inh Ing Con	Mild irritation of the eyes, nose, and throat; drowsiness, dizziness, headache; dry, cracked skin.	Eye: Irrigate immediately Skin: Water flush Breath: Respiratory support Swallow: Immediate medical attention	400 ppm 400 ppm	NA 500 ppm	PEL TLV	2,000 ppm [LEL]
Lead inorganic dusts & fumes (as Pb) [7439-92-1]	NA	NA	Inh Ing Con	Weakness, lassitude, insomnia; facial pallor; eye pallor, low body weight, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremors; wrist and ankle paralysis; brain damage; kidney damage; irritated eyes; hypotension.	Eye: Irrigate immediately Skin: Soap flush promptly Breath: Respiratory support Swallow: Immediate medical attention	0.05 mg/m ³ 0.05 mg/m ³ (NIC) (CA - See 29 CFR 1910.1025)	NA NA	PEL TLV	100 mg/m ³ (as Pb)
Motor oil [NA]	NA	oily	Inh Ing	See oil mist; usually only a problem if misted or ingested.	Eye: Irrigate immediately Skin: Soap wash immediately Swallow: Immediate medical attention	NA	NA	NA	ND

Refer to footnotes at end of table.

Table 2-1

Physical Properties of Chemicals
Site Investigation at Artillery and Mortar Impact Areas South of Bains Gap Road
Fort McClellan, Calhoun County, Alabama

(Page 2 of 3)

Substance [CAS]	IP ^a (eV)	Odor Type & Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Nitric acid [7697-37-2]	11.95	acid/ suffocating 0.3B1	Inh Ing Con	Irritated eyes, mucous membranes, and skin; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Respiratory support Swallow: Immediate medical attention	2 ppm 2 ppm	NA 4 ppm	PEL TLV	25 ppm
Portland cement [65997-15-1]	NA	odorless	Inh Ing Con	Irritated eyes, skin, nose; coughing; wheezing; dermatitis.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Fresh air Swallow: Immediate medical attention	15 mg/m ³ (total) 5 mg/m ³ (respirable) 10 mg/m ³	NA NA NA	PEL PEL TLV	5000 mg/m ³
Sodium hydroxide [1310-73-2]	NA	odorless	Inh Ing Con	Irritated nose; pneumonitis; burns eyes, and skin; temporary loss of hair.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention	2 mg/m ³ NA	NA C 2 mg/m ³	PEL TLV	10 mg/m ³
Sulfuric acid [7664-93-9]	NA	irritating 0.15	Inh Ing Con	Irritated eyes, nose, and throat; pulmonary edema, bronchitis; emphysema; dental erosion; conjunctivitis; tracheobronchitis; skin and eye burns; dermatitis.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention	1 mg/m ³ 1 mg/m ³	NA 3 mg/m ³	PEL TLV	15 mg/m ³
2,4,6-Trinitrotoluene (TNT) [118-96-7]	10.59	odorless	Inh Abs Ing Con	Liver damage, jaundice; cyanosis; sneezing coughing, sore throat; peripheral neuropathy, muscular pain; kidney damage; cataract; sensitive dermatitis; leukocytosis; anemia; cardiac irregularities.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	1.5 mg/m ³ (skin) 0.1 mg/m ³ (skin)	NA NA	PEL TLV	500 mg/m ³

Refer to footnotes at end of table.

Table 2-1

Physical Properties of Chemicals Site Investigation at Artillery and Mortar Impact Areas South of Bains Gap Road Fort McClellan, Calhoun County, Alabama

(Page 3 of 3)

^aIP = Ionization potential (electron volts).

^bRoute: Inh = Inhalation; Abs = Skin absorption; Ing = Ingestion; Con = Skin and/or eye contact.

^cTWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.

^dSTEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.

^eSource: PEL = Permissible Exposure Limit (OSHA - 29 CFR 1910.1000, Table Z); TLV = Threshold Limit Value (ACGIH); NIOSH = National Institute for Occupational Safety and Health; WEEL = Workplace Environmental Exposure Level (AIHA).

^fIDLH (NIOSH) = Immediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.

ppm = Parts per million

mg/m³ = Milligrams per cubic meter

skin = Danger of cutaneous absorption

ND = No evidence could be found for the existence of an IDLH (National Institute for Occupational Safety and Health Pocket Guide to Chemical Hazards, Pub. No. 94-116, June 1994)

C = Ceiling limit value which should not be exceeded at any time.

Ca = Carcinogen.

NA = Not applicable or not available.

LEL = Lower explosive limits.

LC₅₀ = Lethal concentration in air for 50 percent of population tested.

LD₅₀ = Lethal dose for 50 percent of population tested.

NIC = Notice of intended change (ACGIH).

References:

Guide to Occupational Exposure Values - 1997, Compiled by the American Conference of Governmental Industrial Hygienists (ACGIH).

Lewis, Richard J., Sr., 1992, Sax's Dangerous Properties of Industrial Materials, 8th ed., Van Nostrand Reinhold, New York.

Micromedex Tomes Plus (R) System, 1995, Micromedex, Inc.

Pocket Guide to Chemical Hazards, Pub. No. 94-116, June 1994, National Institute for Occupational Safety and Health (NIOSH).

Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association (AIHA), 1989.

Workplace Environmental Exposure Levels, American Industrial Hygiene Association (AIHA), 1995.

3.0 Personal Protective Equipment

The work activities will begin in the following levels of protection. Also, a completed description of Level D, Modified Level D, and Level C PPE is provided.

Task	Initial Level of PPE
Staging equipment	Level D
Install monitoring wells	Modified Level D*
Collecting samples	Modified Level D*

*Initial level will be raised to Level C or higher if air monitoring results for volatile organic hydrocarbons in the worker's breathing zone are greater than action levels.

Level D. The minimal level of protection that will be required of IT Corporation personnel at the site will be Level D. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Leather work gloves (when necessary)
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Modified Level D. The following equipment will be used for Level D-Modified protection:

- Permeable Tyvek, Kleenguard, or its equivalent
- Latex boot covers
- Nitrile, heavy work, or latex gloves
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to modifying Level D PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet and a face shield.

Note: UXO personnel should not wear hard hats and steel-toed shoes when engaged in ordnance operations unless a significant overhead hazard exists. Where overhead hazards exist, a chin strap will be worn with hard hats to prevent accidental falling of hard hat.

Level C. Level C protection will not be used unless air-monitoring data indicate the need for upgrade; however, the equipment shall be readily available on site. The following equipment will be used for Level C protection:

- X National Institute of Occupational Safety and Health-approved full-face, air-purifying respirators equipped with organic vapor/acid gas/P100 cartridge
- X Hooded Tyvek, taped at gloves, boots, and respirator
- X Nitrile gloves (outer)
- X Latex or lightweight nitrile gloves (inner)
- X Neoprene steel-toed boots or polyvinyl chloride overbooties/steel-toed safety boots
- X Hard hat
- X Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet and a face shield.

Note: UXO personnel should not wear hard hats and steel-toed shoes when engaged in ordnance operations unless a significant overhead hazard exists. Where overhead hazards exist, a chin strap will be worn with hard hats to prevent accidental falling of hard hat.

4.0 Site Monitoring

The environmental contaminants of concern resulting from Artillery and Mortar Impact Areas South of Bains Gap Road operations are lead and TNT. Table 4-1 contains action levels for site monitoring at the sites.

Chemical. Monitoring will be performed by the site safety and health officer during the performance of ground intrusive operations. A calibrated photoionization detector (i.e., Photovac 2020 photoionization detector or equivalent) organic vapor analyzer will be utilized to monitor the sampling locations and breathing zones to determine if any organic material may be present that would necessitate upgrading of protection level. Table 4-2 contains the air monitoring frequency and location for site monitoring at the work sites.

Unexploded Ordnance. UXO safety will be achieved by employing UXO specialists to ensure that field personnel do not come into contact with UXO. In areas where UXO is suspected to exist, the UXO specialists will perform the following UXO avoidance operations.

- X **Area UXO Surveys Using Magnetometers.** During this operation, UXO on the surface will be detected and marked for avoidance during field operations. Metal objects just below the surface (within 2 feet) will also be marked to indicate the potential hazard.
- X **Downhole UXO Surveys.** UXO specialists will perform downhole magnetometer surveys to detect metal objects in the path of the boring apparatus until undisturbed soils are reached. The boring location will be moved if subsurface metal objects are detected.

If UXO is encountered, personnel will contact the site manager and UXO specialist immediately. Personnel will evacuate the immediate area and secure it.

Table 4-1

Action Levels
Artillery and Mortar Impact Areas South of Bains Gap Road
Fort McClellan, Calhoun County, Alabama

(Page 1 of 2)

When in Level C PPE

Analyte	Action Level	Required Action ^a
Volatile Organic Compounds (VOCs)	≥ 10 ppm above background in breathing zone (BZ)	Stop work, evacuate work area, upgrade to Level B.
Oxygen	$\geq 20\%$, $\leq 23\%$ $< 20\%$, $> 23\%$	Normal operations. Stop work, evacuate work area.
Flammable vapors	$\geq 10\%$ LEL $< 10\%$ LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.

When in Level D Modified/D PPE

Analyte	Action Level	Required Action ^b
VOCs	≥ 5 ppm above background in BZ	Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE.
Oxygen	$\geq 20\%$, $\leq 23\%$ $< 20\%$, $> 23\%$	Normal operations. Stop work, evacuate work area.
Flammable vapors	$\geq 10\%$ LEL $< 10\%$ LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.

Table 4-1

Action Levels
Artillery and Mortar Impact Areas South of Bains Gap Road
Fort McClellan, Calhoun County, Alabama

(Page 2 of 2)

When in Support Zone

Analyte	Action Level	Required Action
VOCs	≥ 1 ppm above background in BZ	Evacuate support zone and re-establish perimeter of exclusion zone.

^a Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

^b Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the H&S manager.

Table 4-2

**Air Monitoring Frequency and Location
Artillery and Mortar Impact Areas South of Bains Gap Road
Fort McClellan, Calhoun County, Alabama**

Work Activity	Instrument	Frequency	Location
Staging equipment	OV Monitor	Initially for area	Breathing zone (BZ) of employees
Land Survey	OV Monitor	Initially for area	BZ of employees
Sampling (water, sediment, and soil)	OV Monitor LEL/O ₂ Monitor	Continuously Continuously	BZ of employees and/or work area
Installing monitoring wells	OV Monitor LEL/O ₂ Monitor	Continuously Continuously	BZ of employees and/or work area

OV = Organic vapor.

LEL/O₂ = Lower explosive level/oxygen.

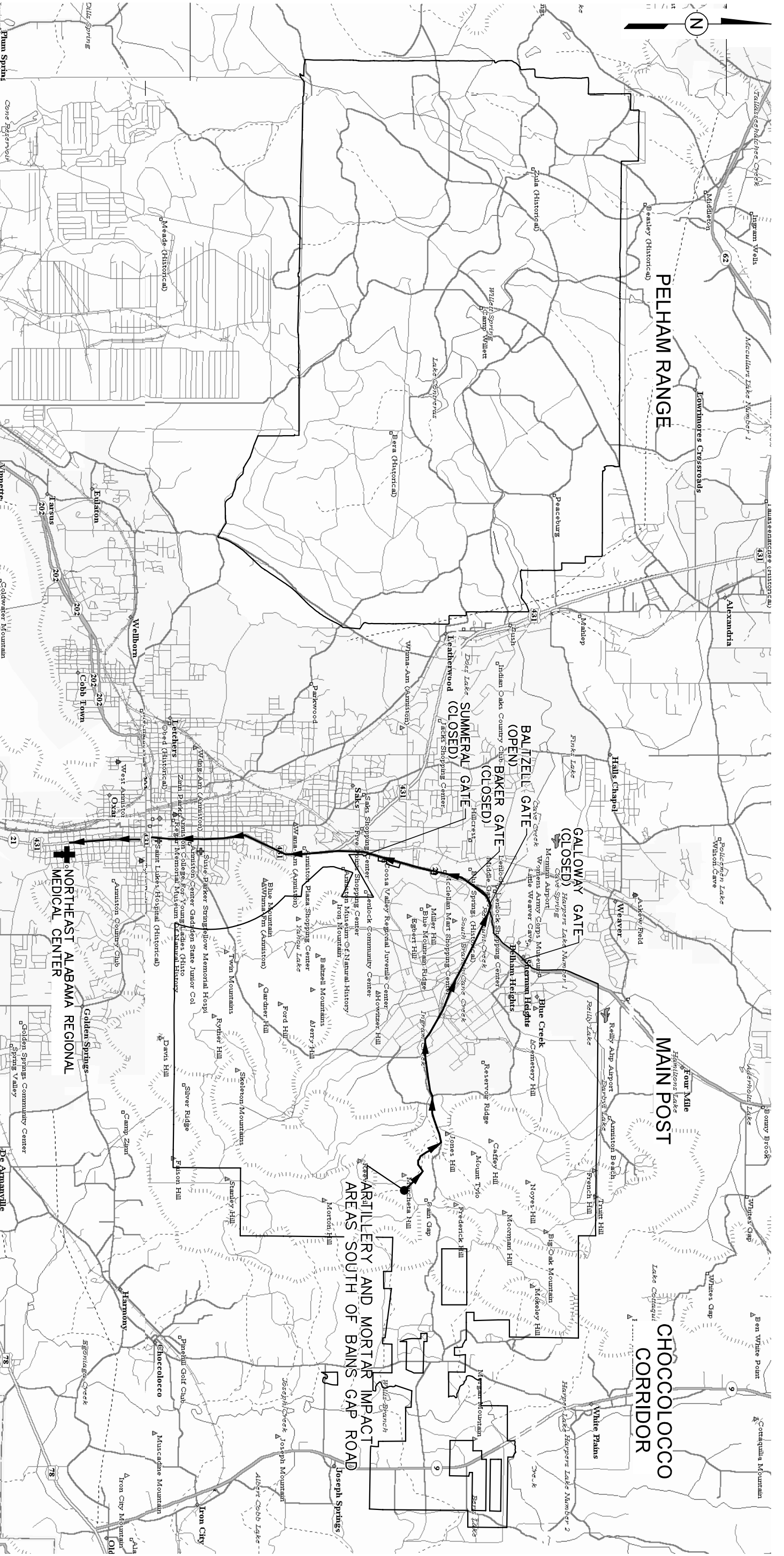
5.0 Activity Hazard Analysis

The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- X Setup of equipment and general field activities
- X Land survey
- X Soil, surface water, seep water, and sediment sampling.

All injuries and illnesses must be immediately reported to the site manager or the site safety and health officer, who will then notify off-site personnel and organizations as necessary.

If hospital care must be provided, the victim shall be treated at the Alabama Northeast Regional Medical Center. Directions to the hospital are provided in Figure 5-1.



LEGEND:

- ROUTE TO NORTHEAST ALABAMA REGIONAL MEDICAL CENTER
- U.S. HIGHWAY
- HOSPITALS
- INVESTIGATION SITE

DRIVING DIRECTIONS FROM BALTZELL GATE ROAD TO THE NORTHEAST ALABAMA MEDICAL CENTER

- LEAVING FORT MCCELLELLAN ON BALTZELL GATE ROAD, TURN LEFT (SOUTH) ONTO AL HWY 21
- GO ~ 2.5 MILES WHERE AL HWY 21 MERGES WITH U.S. HWY 431 AND CONTINUE SOUTH
- CONTINUE SOUTH ON AL21/US431 FOR ~ 2.7 MILES
- TURN LEFT ONTO EAST 10th STREET
- GO ~ 0.2 MILE TO MEDICAL CENTER ON RIGHT

FIGURE 5-1
HOSPITAL EMERGENCY ROUTE

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT MCCELLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

Table 5-1

**Activity Hazard Analysis
Artillery and Mortar Impact Areas South of Bains Gap Road
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 13)

Activity	Potential Hazards	Recommended Controls
Staging equipment	Unexploded ordnance (UXO)	X UXO specialists will perform UXO surface clearance and/or UXO downhole clearance for UXO avoidance. See site-specific safety and health plans (SSHP) to determine if required.
	Slip, trip, and fall hazards	X Determine best access route before transporting equipment. X Practice good housekeeping; keep work area picked up and clean as feasible. X Continually inspect the work area for slip, trip, and fall hazards. X Look before you step; ensure safe and secure footing.
	Heavy lifting	X Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment.
	Falling objects	X Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots.
	Flying debris, dirt, dust, etc.	X Wear safety glasses/goggles; ensure that eye wash is in proper working condition.
	Pinch points	X Keep hands, fingers, and feet clear of moving/suspended materials and equipment. X Beware of contact points. X Stay alert at all times!
	Cuts/bruises	X Use cotton or leather work gloves for material handling.
	Bees, spiders, and snakes	X Inspect work area carefully and avoid placing hands and feet into concealed areas.
	Ticks	X Wear light colored clothing (can see ticks better). X Mow vegetated and small brush areas. X Wear insect repellent. X Wear long sleeves and long pants. X Visually check oneself promptly and frequently after exiting the work area.
	Fire	X Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.

Table 5-1

**Activity Hazard Analysis
Artillery and Mortar Impact Areas South of Bains Gap Road
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 13)

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Contact with moving equipment/vehicles	X Work area will be barricaded/demarcated. X Equipment will be laid out in an area free of traffic flow.
	Hazard communication	X Label all containers as to contents and dispose of properly. X Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site.
	Noise	X Sound levels above 85 decibels (dBA) mandates hearing protection.
	Lighting	X Adequate lighting will be provided to ensure a safe working environment.
	Cold stress	X Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F). X Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. X Remove wet clothing promptly. X Take breaks in warm areas. X Reduce work periods as necessary. X Layer work clothing.
	Poison ivy/oak/sumac	X Avoid plant areas if possible. X Wear long sleeves and long pants. X Promptly wash clothing that has contacted poisonous plants. X Wash affected areas immediately with soap and water.
	Heat rash	X Keep the skin clean and dry. X Change perspiration-soaked clothing, as necessary. X Bathe at end of work shift or day. X Apply powder to affected area.
	Heat cramps	X Drink plenty of cool fluids even when not thirsty. X Provide cool fluid for work crews. X Move victim to shaded, cool area.

Table 5-1
Activity Hazard Analysis
Artillery and Mortar Impact Areas South of Bains Gap Road
Fort McClellan, Calhoun County, Alabama

(Page 3 of 13)

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Heat exhaustion	<ul style="list-style-type: none"> X Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). X Set up work/rest periods. X Use the buddy system. X Allow workers time to acclimate. X Have ice packs available for use. X Take frequent breaks.
	Heat stroke	<ul style="list-style-type: none"> X Evaluate possibility of night work. X Perform physiological monitoring on workers during breaks. X Wear body cooling devices.
	Contact with moving equipment/vehicles	<ul style="list-style-type: none"> X Work area will be barricaded/demarcated. X Equipment will be laid out in an area free of traffic flow. X Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic. X Barriers shall be used to protect workers from vehicular traffic. X Barriers shall be used to guard excavations adjacent to streets or roadways. X Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided. X Heavy equipment shall have backup alarms.
	Forklift operations	<ul style="list-style-type: none"> X Use qualified and trained forklift operators. X The operator shall not exceed the load capacity rating for the forklift. X The load capacity shall be clearly visible on the forklift. X Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Portable electric tools	<ul style="list-style-type: none"> X Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service. X Portable electric tools and all cord and plug connected equipment shall be protected by a ground fault circuit interrupter (GFCI) device. X Electrical tools shall be inspected daily prior to use.

Table 5-1
Activity Hazard Analysis
Artillery and Mortar Impact Areas South of Bains Gap Road
Fort McClellan, Calhoun County, Alabama

(Page 4 of 13)

Activity	Potential Hazards	Recommended Controls
Staging equipment (continued)	Extension cords	<ul style="list-style-type: none"> X Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service. X Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic. X Cords shall be suspended with a nonconductive support (rope, plastic ties, etc.). X Cords shall be designed for hard duty. X Cords shall be inspected daily.
	Lightning strikes	<ul style="list-style-type: none"> X Whenever possible, halt activities and take cover. X If outdoors, stay low to the ground. X Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). X Seek shelter in a building if possible. X Stay away from windows. X If available, crouch under a group of trees instead of one single tree. X Keep all body parts in contact with the ground as close as possible. X Remain 6 feet away from tree trunk if seeking shelter beneath tree(s). X If in a group, keep 6 feet of distance between people.
	Thunderstorms, tornadoes	<ul style="list-style-type: none"> X Listen to radio or TV announcements for pending weather information. X Cease field activities during thunderstorm or tornado warnings. X Seek shelter. Do not try to outrun a tornado.
Surveying	Slip, trip, fall	<ul style="list-style-type: none"> X Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field. X Provide adequate lighting in all work areas. X Whenever possible, avoid routing cords and hoses across walking pathways. X Flag or cover inconspicuous holes to protect against falls. X Work areas will be kept clean and orderly. X Garbage and trash will be disposed of daily in approved refuse containers. X Tools and accessories will be properly maintained and stored. X Work areas and floors will be kept free of dirt, grease, and slippery materials.
	UXO	<ul style="list-style-type: none"> X UXO specialists will perform UXO surface clearance for UXO avoidance.

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Activity	Potential Hazards	Recommended Controls
Surveying (continued)	Traffic accidents	<ul style="list-style-type: none"> X Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians. X If working adjacent to roadways, have workers wear fluorescent orange vests. X Use warning signs or lights to alert oncoming traffic. X Assign flag person(s) if necessary to direct local traffic. X Set up temporary parking locations outside the immediate work area. X Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits. X Pedestrians have the right-of-way. X Wear seat belts when vehicles are in motion.
	Wildlife hazards	<ul style="list-style-type: none"> X Workers should be cautious when driving through the site in order to avoid encounters with passing animals.
	Biological hazards	<ul style="list-style-type: none"> X Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads).
	Ticks	<ul style="list-style-type: none"> X Wear light colored clothing (can see ticks better). X Mow vegetated and small brush areas. X Wear insect repellent. X Wear long sleeves and long pants. X Visually check oneself promptly and frequently after exiting the work area.
	Poison ivy/oak/sumac	<ul style="list-style-type: none"> X Avoid plant areas if possible. X Wear long sleeves and long pants. X Promptly wash clothing that has contacted poisonous plants. X Wash affected areas immediately with soap and water.
Hydropunch sampling	Faulty or damaged equipment being utilized to perform work	<ul style="list-style-type: none"> X All machinery or mechanized equipment will be inspected by a competent mechanic and be certified to be in safe operating condition. X Equipment will be inspected before being put to use and at the beginning of each shift. X Faulty/unsafe equipment will be tagged and if possible locked out. X Drill rigs shall be equipped with reverse signal alarm, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so.

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Fort McClellan, Calhoun County, Alabama

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Activity	Potential Hazards	Recommended Controls
Hydropunch sampling (continued)	Uneven terrain, poor ground support, inadequate clearances, contact with utilities	<ul style="list-style-type: none"> X Inspections or determinations of road conditions and structures shall be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment. X All mobile equipment and areas in which they are operated shall be adequately illuminated. X Whenever the equipment is parked, the parking brake shall be set. X Equipment parked on inclines will have the wheels chocked. X Inspect brakes and tire pressure on drill rig before staging for work. X Obtain trenching/drilling permit prior to operation.
	Inexperienced operator	<ul style="list-style-type: none"> X Machinery and mechanized equipment shall be operated only by designated personnel. X Heavy equipment operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgement.
	Jacks/outriggers	<ul style="list-style-type: none"> X Ensure proper footing and cribbing.
	UXO	<ul style="list-style-type: none"> X UXO specialists will perform UXO surface clearance and/or UXO downhole clearance for UXO avoidance.
	Falling objects	<ul style="list-style-type: none"> X Remove unsecured tools and materials before raising or lowering the derrick. X Stay alert and clear of materials suspended overhead.
	Pinch points	<ul style="list-style-type: none"> X Keep feet and hands clear of moving/suspended materials and equipment. X Stay alert at all times!
	Fire	<ul style="list-style-type: none"> X Mechanized equipment shall be shut down prior to and during fueling operations. X Have fire extinguishers inspected and readily available.
	Fall hazards	<ul style="list-style-type: none"> X Personnel are not allowed to work off of machinery or use them as ladders. X Use fall protection when working above 6 feet.
	Noise	<ul style="list-style-type: none"> X Hearing protection is mandatory above 85 dBA.
	Contact with rotating or reciprocating machine part	<ul style="list-style-type: none"> X Use machine guards; use long-handled shovels to remove auger cuttings. X Safe lockout procedures for maintenance work.

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Activity	Potential Hazards	Recommended Controls
Hydropunch sampling (continued)	Heavy lifting	X Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Slip, trip, and fall hazards	X Practice good housekeeping; keep work area picked up and clean as feasible. X Continually inspect the work area for slip, trip, and fall hazards.
	Contact with potentially contaminated materials	X Real-time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized.
Soil boring and surface/subsurface sampling	Cross-contamination and contact with potentially contaminated materials	X Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. X Avoid skin contact with paint. X Handle samples with care. X Only essential personnel will be in the work area. X All personnel will follow good hygiene practices. X Proper decontamination procedures will be followed. X All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	X Use care when handling glassware. X Wear adequate hand protection.
	Slip, trip, and fall hazards	X Practice good housekeeping; keep work area picked up and clean as feasible. X Continually inspect the work area for slip, trip, and fall hazards.
	UXO	X UXO specialists will perform UXO surface clearance and/or UXO downhole clearance for UXO avoidance.
	Bees, spiders, and snakes	X Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas. X Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms.
	Poison ivy/oak/sumac	X Avoid plant areas if possible. X Wear long sleeves and long pants. X Promptly wash clothing that has contacted poisonous plants. X Wash affected areas immediately with soap and water.

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Activity	Potential Hazards	Recommended Controls
Soil boring and surface/subsurface sampling (continued)	Cold stress	<ul style="list-style-type: none">X Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F).X Drink warm beverages on breaks. Refrain from drinking caffeinated beverages.X Remove wet clothing promptly.X Take breaks in warm areas.X Reduce work periods as necessary.X Layer work clothing.
	Access/egress hazards	<ul style="list-style-type: none">X Use qualified and trained bushhog operator.X Keep employees out of the bushhog work area.X Utilize good housekeeping practices.X Keep aisleways, pathways, and work areas free of obstruction.X Clean ice or snow off of walkways or work stations.X Use appropriate footwear for the task assigned.
	Heat rash	<ul style="list-style-type: none">X Keep the skin clean and dry.X Change perspiration-soaked clothing, as necessary.X Bathe at end of work shift or day.X Apply powder to affected area.
	Heat cramps	<ul style="list-style-type: none">X Drink plenty of cool fluids even when not thirsty.X Provide cool fluid for work crews.X Move victim to shaded, cool area.
	Heat exhaustion	<ul style="list-style-type: none">X Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature).X Set up work/rest periods.X Use the buddy system.X Allow workers time to acclimate.X Have ice packs available for use.X Take frequent breaks.
	Heat stroke	<ul style="list-style-type: none">X Evaluate possibility of night work.X Perform physiological monitoring on workers during breaks.X Wear body cooling devices.

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Activity	Potential Hazards	Recommended Controls
Soil boring and surface/subsurface sampling (continued)	Lightning strikes	<ul style="list-style-type: none"> X Whenever possible, halt activities and take cover. X If outdoors, stay low to the ground. X Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). X Seek shelter in a building if possible. X Stay away from windows. X If available, crouch under a group of trees instead of one single tree. X Keep all body parts in contact with the ground as close as possible. X If in a group, keep 6 feet of distance between people.
	Thunderstorms, tornadoes	<ul style="list-style-type: none"> X Listen to radio or TV announcements for pending weather information. X Cease field activities during thunderstorms or tornado warnings. X Seek shelter. Do not try to outrun a tornado.
Moving and shipping collected samples	Heavy lifting	<ul style="list-style-type: none"> X Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Pinch points	<ul style="list-style-type: none"> X Keep hands, fingers, and feet clear of moving/suspended materials and equipment. X Beware of contact points. X Stay alert at all times!
	Cut hazards	<ul style="list-style-type: none"> X Wear adequate hand protection. Use care when handling glassware.
	Hazard communication	<ul style="list-style-type: none"> X Label all containers as to contents and associated hazards.
	Heavy lifting	<ul style="list-style-type: none"> X Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
Material storage	Flammable and combustible liquids	<ul style="list-style-type: none"> X Store in NO SMOKING AREA. X Fire extinguisher readily available. X Transfer only when properly grounded and bonded.
Surface Water/Sediment/Seep Water Sampling	Drowning	<ul style="list-style-type: none"> X Personnel will wear personal flotation devices when working on, over, or adjacent to water.

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Activity	Potential Hazards	Recommended Controls
Surface Water/Sediment/ Seep Water Sampling (continued)	Contact with contaminated materials	X Wear proper PPE when conducting sampling activities.
	Cross-contamination and contact with potentially contaminated materials	X Stop immediately at any sign of obstruction. X Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. X Only essential personnel will be in the work area. X Real-time air monitoring will take place before and during sampling activities. X All personnel will follow good hygiene practices. X Proper decontamination procedures will be followed. X All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	X Use care when handling glassware. X Wear adequate hand protection.
	Slip, trip, fall	X Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe/shank boots when working in the field. X Whenever possible, avoid routing cords and hoses across walking pathways. X Flag or cover inconspicuous holes to protect against falls.
	UXO	X UXO specialists will perform UXO surface clearance and/or UXO downhole clearance for UXO avoidance.
	Bees, spiders, and snakes	X Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas. X Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms.

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Activity	Potential Hazards	Recommended Controls
Surface Water/Sediment/ Seep Water Sampling (continued)	Poison ivy/oak/sumac	<ul style="list-style-type: none"> X Avoid plant areas if possible. X Wear long sleeves and long pants. X Promptly wash clothing that has contacted poisonous plants. X Wash affected areas immediately with soap and water.
	Access/egress hazards	<ul style="list-style-type: none"> X Use qualified and trained bushhog operator. X Keep employees out of the bushhog work area. X Utilize good housekeeping practices. X Keep aisleways, pathways, and work areas free of obstruction. X Clean ice or snow off of walkways or work stations. X Use appropriate footwear for the task assigned.
Disposal of investigation-derived waste (IDW) (Forklift Operation)	Personnel injury, property damage, and/or equipment damage	<ul style="list-style-type: none"> X Use qualified and trained forklift operators. X The operator shall not exceed the load capacity rating for the forklift. X The load capacity shall be clearly visible on the forklift. X Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Cross-contamination and contact with potentially contaminated materials	<ul style="list-style-type: none"> X Stop immediately at any sign of obstruction. X Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. X Only essential personnel will be in the work area. X Real-time air monitoring will take place before and during sampling activities. X All personnel will follow good hygiene practices. X Proper decontamination procedures will be followed. X All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	<ul style="list-style-type: none"> X Use care when handling glassware. X Wear adequate hand protection.

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**Activity Hazard Analysis
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Activity	Potential Hazards	Recommended Controls
High-pressure water jetting operations	Heavy lifting	<ul style="list-style-type: none"> X Use proper lifting techniques. X Lifts greater than 60 pounds require assistance or mechanical equipment; size-up the lift.
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> X Good housekeeping shall be implemented. X The work area shall be kept clean as feasible. Inspect the work area for slip, trip, and fall hazards.
	Fueling	<ul style="list-style-type: none"> X Only approved safety cans shall be used to store fuel. X Do not refuel equipment while it is operating. X Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Faulty or damaged equipment	<ul style="list-style-type: none"> X Equipment shall be inspected before being placed into service and at the beginning of each shift. X Preventive maintenance procedures recommended by the manufacturer shall be followed. X A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
	High-pressure water	<ul style="list-style-type: none"> X Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate). X One standby person shall be available within the vicinity of the pump during jetting operation. X The work area shall be isolated and adequate barriers will be used to warn other site personnel.
	Unqualified operators	<ul style="list-style-type: none"> X Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning.
	Out of control equipment	<ul style="list-style-type: none"> X No machinery or equipment is permitted to run unattended. X Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
	Noise	<ul style="list-style-type: none"> X Sound levels above 85 dBA mandates hearing protection by nearby site personnel.
High-pressure water jetting operations	Activation during repairs	<ul style="list-style-type: none"> X All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.

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**Activity Hazard Analysis
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Activity	Potential Hazards	Recommended Controls
operations (continued)	Pinch points	X Keep feet and hands clear of moving/suspended materials and equipment. X Stay alert and clear of materials suspended.
	Falling objects	X Hard hats are required by site personnel. X Stay alert and clear of material suspended overhead.
	Flying debris	X Impact-resistant safety glasses with side shields are required.
	Contact with potentially contaminated materials	X All site personnel will wear the appropriate PPE.